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ABSTRACT

Models that have appeared in the student attrition literature in the past decade and behavioral models from the social sciences that may help explain the dropout process are examined, and an attempt is made to synthesize a causal model of student attrition. The models of Tinto, Spady, and Rootman in the area of student attrition, and models of student participation (Boshier), status attainment (Sewell and Hauser), turnover in work organizations (Price), suicide (Durkheim), and the relation between intentions and behavior (Fishbein and Ajzen) are addressed. Bean's industrial model of student attrition and Pascarella's model concerning student/faculty informal contacts are also included. The synthetic model identifies four classes of variables: background variables, organizational variables, environmental variables, and attitudinal and outcome variables, all of which have direct or indirect effects on intent to leave, which is the immediate precursor of dropping out. Variables can be added to or deleted from the model to match the particular needs of an institution. Twenty-three variables that may be important predictors of dropping out are identified. The relative causal importance of these variables to dropping out can be assessed using stepwise multiple regression analysis in a path analytic framework. In addition, effects coefficients can indicate the total contributions of one variable on dropping out in terms of both indirect and direct effects. Charts that depict the various models and a bibliography are included. (SW)

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THE SYNTHESIS OF A THEORETICAL MODEL OF STUDENT ATTRITION

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THE SYNTHESIS OF A THEORETICAL MODEL OF STUDENT ATTRITION

ABSTRACT

The lack of theoretical models has long plagued researchers in the area of student attrition. The models of Tinto, Spady, and Rootman in the area of student attrition, and models of student participation, status attainment, turnover in work organizations, suicide, and the relation between intentions and behavior are presented and discussed. A synthetic model incorporating selected elements from these models is developed and presented. In one study the variables in this model accounted for about 50 percent of the variance in dropout for university freshmen.

THE SYNTHESIS OF A THEORETICAL MODEL OF STUDENT ATTRITION

Introduction

Among the major reviews of the literature related to student attrition, the lack of theoretical models has created difficulties both in constructing and in comparing empirical studies (Knoell, 1960; Spady, 1970; Tinto, 1975; Pantages and Creedon, 1978). The advantages of using a theoretical perspective in designing research problems is well known. Theory guides research, and prevents either the reinvention of the wheel or the analysis of variables which show little potential for explaining the attrition process. Theory can potentially bring order to a confusing array of variables, each of which, in someone's study or another, has had a significant zero-order correlation with attrition.

The purpose of this paper is to review and summarize several of the models, implicit or explicit, which have appeared in the student attrition literature in the past decade. In addition, behavioral models from the social sciences will be examined to see if they can be used to help explain the dropout process. An attempt will be made to synthesize these models, incorporating elements from the relevant behavioral models into a synthetic causal model of student attrition. The theoretical frameworks for this study are derived from models provided from the educational, psychological, and sociological literature. The synthetic model is derived from studies of student attrition, student participation, status attainment, turnover in work organizations, research on suicide, and research on the relationship between intentions and behavior. It is not the purpose of this paper to systematically review and appraise past empirical studies of attrition, although some will be cited.

The perspective used in this study is that of the individual student at a single institution. The model to be formulated is not a generalized model of student flow from high school through college to work. It represents the kind of information an institution would need to know about itself, and its

students, so that at a particular time, students with a high potential for dropping out could be identified along with the probable reasons for their leaving school.

Models from the Literature

A review of the literature indicates that there may be more theoretical material present which is related to attrition than is ordinarily believed. Tinto (1975), after Tinto and Cullen (1973), published a model which is widely cited and has received the most attention in empirical studies. This model was greatly influenced by the work of Spady (1970) who used Durkheim's (1951) model of suicide as the theoretical foundation for his first attempt to develop a longitudinal causal model of the attrition process. It is appropriate to begin with a discussion of Durkheim's model.

Durkheim (1951): Suicide

Durkheim's (1951) monumental work on suicide, first published in translation in this country in 1951, was initially used by Spady (1970) and later by Tinto (1975). Spady was selective in his use of Durkheim's theories, and these seem to reflect Parson's (1949: 324-38) interpretation of Durkheim's model. Parson's interpretation has recently been challenged by Pope (1976). For Spady (1970), two aspects of Durkheim's work were important. Stated as hypotheses, these would be: when a person shares values with a group, this person is less likely to commit suicide (or by analogy, to drop out of school); and 2) when a person has friendship support, this person is less likely to commit suicide (or drop out of school). Durkeim stated several things which are relevant to this form of suicide, which he called "egoistic." First he wrote that integration into religious, domestic, or political society reduces the likelihood of an individual's committing suicide (p. 208), and thus "suicide varies inversely with the degree of integration of the social groups which the individual forms a part"(p. 209). This seems to constitute what

Spady calls "shared group values." Durkheim wrote that:

> There is, . . . in a cohesive and animated society a constant interchange of ideas and feelings from all to each and each to all, something like a mutual moral support, which instead of throwing the individual on his own resources, leads him to share in the collective energy and supports his own when exhaused. (p. 210)

This, however, was seen as a secondary reason for committing suicide.

The other major type of suicide which Durkheim described is called altruistic suicide. Altruistic suicide results from excessive social regulation, or from a lack of social regulation. Pope (1976), contrary to Parsons (1949), postulated that it is a moderate amount of integration and regulation that prevents people from committing suicide. "When either is high or low, the suicide rate is high; when either is moderate, the rate is low." (Pope 1976, p. 14). Thus, the two variables Spady selected as causes of suicide (lack of shared group values and lack of friendship support), were not the only ones posed by Durkheim. Secondly, the more recent interpretation of Durkheim's theories by Pope suggests that shared group values would reduce the likelihood of dropping out only when these group values are moderately shared, and only when friendship support is not at an extreme level. Spady used this approach in operationalizing some variables in his model (Spady, 1971), but is is not clear from his model that normative amounts of shared group values and friendship support are least likely to lead to attrition.

Spady omitted Durkheim's second major theory of suicide as a potential analogous influence on a student's dropping out of school: the degree of regulation of the society in which a person lives. Durkheim wrote that when regulation was very high, the importance of the individual declined, and the sense of anomie or alienation increased, possibly leading to suicide. When social regulation was extremely low, passions were unchecked, and again the likelihood of suicide increased. The analogy for student attrition is that as regulations increase, personal freedoms decrease, and the student becomes

disillusioned with the process (like being treated like a computer card), and withdraws from this system. On the other extreme, when regulation is quite low, discipline breaks down, and the student, uncontrolled by the institution, withdraws from it. The student may also think that when regulation is low, the institution doesn't care about students, and drop out. It seems that this second interpretation of Durkheim's theory of suicide may also cast some light on the student attrition process.

Spady (1970): The First Theoretical Model of the Dropout Process

Spady (1970) selectively borrowed Durkheim's idea that shared group values and friendship support are expected to reduce suicide, and by analogy, dropout. This theory forms the foundation for the Spady and Tinto models where social and academic integration, which correspond to shared group values and friendship support, are both expected to influence the decision to drop out. Spady's "Explanatory Sociological Model of the Dropout Process " (1970), constitutes the first full blown theoretical model of the dropout process. In his model (Figure 1), shared group values, grade performance, normative congruence, and friendship support were expected to lead to increased social integration. Social integration increased satisfaction, which increased institutional commitment. Institutional commitment in turn reduced the likelihood of dropping out.

Several characteristics of this model are worthy of discussion. To begin with, Spady specified that dropout decisions were the result of a longitudinal process. Secondly, he identified background characteristics as important in the dropout process, specifically, family background, academic potential, ability, and socio-economic status. Next, directly from Durkheim, he identified normative congruence and friendship support as important endogenous variables in his model. To these he added the college-specific variables of grade performance and intellectual development. This model indicated that all of these lead to greater social integration. Social integration was expected to increase satisfaction, which in turn would increase institutional commitment,

which was the direct antecedent of dropout. In addition, grade performance, because a student can flunk out of school, could be expected to have a direct effect on the decision to drop out. In this case, institutional commitment was operationalized in Spady's (1971) empirical study by a question which asked the extent to which the student hoped to graduate from the University of Chicago, from which his sample was taken.

Spady did have some problems in operationalizing other variables in a way which makes them interpretable in instituion decision making. For example, normative congruence was constructed from five different areas of measurement: patterns of relationships and expectation from high school; personality dimensions; intellectual, moral, and vocational values; attitudes toward the University of Chicago; and three measures of campus sub-cultural orientation. The empirical model of the undergraduate dropout process derived from Spady's (1971) study of Chicago dropouts, demonstrated the complexity of the inter-relationships of the variables which he had identified. One of the important findings from this model is that satisfaction is not directly related to dropout but only indirectly related to dropout through institutional commitment. Secondly, background characteristics did not have direct effects on dropout, and only a direct effect on institutional commitment for men, but not for women. Their absence from the model would not influence the predictive power of the model insofar as dropout is concerned. They are needed primarily to lend clarity to the process and to eliminate spurious conclusions.

Rootman (1972): Adult Socialization

Rootman (1972) studied freshman attrition at the U.S. Coast Guard Academy. He used a very wide range of indicators to come up with what is essentially a simple causal model of voluntary withdrawal from a total adult socializing organization. In this case, voluntary student withdrawal from an organization is viewed as a result of the failure of the adult socialization process. Rootman used a "person-role fit" model derived from the work of Biddle and Thomas (1966:61).

Rootman's model may be simplified so that two independent variables have positive direct effects on voluntary withdrawal, and two have negative effects. Discussing leaving with outsiders and discussing leaving with insiders both are positively related to attrition. These seem similar in effect to intent to leave, in the sense that they may at least partially represent the notion of a self-fulfilling prophecy (Merton, 1968). The second two variables are actual interpersonal fit, and person-role fit, which are negatively associated with voluntary withdrawal. Rootman's operationalization of these two variables is similar to the integration variables which Spady derived from Durkheim. Here, actual interpersonal fit is similar to friendship support, and person-role fit is similar to shared group values. Thus, although working from a largely empirical theoretical base, the findings of Rootman are consistent with the model proposed by Spady.

Sewell and Hauser (1972): Status Attainment

Contrary to Sewell and Hauser, the model being developed in this article is intended to identify the variables which influence a particular individual to leave a particular institution. Thus, this model does not deal with the issues of stop out, or transfer, and certainly does not deal with broad sociological processes such as status attainment. The status attainment literature, however, is relevant to this study. Jencks (1979) treats the subject at length, but provides relatively little information about educational attainment.

The work of Sewell and Hauser (1972), using great methodological sophistication, is especially relevant. They develop a path model in which eleven independent variables are expected to have direct and/or indirect effects on educational attainment. Educational attainment refers to the total number of years of post secondary schooling a student completes. A student who transfers from one institution to another would appear as a dropout in the model developed in this paper, but would increase the score for educational attainment which depends only on the total number of years of post secondary education. The

independent variables expected to influence a student's educational attainment are: father's education, mother's education, father's occupation, parental income, mental ability, high school grades, teachers' encouragement, parental encouragement, friends' plans, college plans, and occupational aspiration. The status attainment literature emphasizes the non-institutional variables which may lead a student to terminate her or his schooling. Institutional characteristics, and the integration of a student into an institution, are totally ignored by Sewell and Hauser. In their study, teachers' encouragement and average parental income were not significantly related to educational attainment, but the other nine variables accounted for 54% of the variance in educational attainment. The best predictor of educational attainment was college plans, followed by high school grades. Status attainment studies, by ignoring the interaction of a student with an institution, fail to address the question of why students dropout, stopout, or transfer from a particular institution.

Boshier (1973): Adult Participation and Dropout

Boshier (1973) produced another model of the attrition process, this time dealing with adult students. Boshier identified two major precursers of the social, psychological, and environmental variables which lead to decisions to drop out. The first type is deficiency motivation, which results from the incongruence between the student role and the self-concept, and between the student and the lecturer, as well as other unidentified incongruencies. The second type is growth motivation, which is the congruence between the student self-concept and the student role, the lecturer, and other unidentified variables. This model seems to have received only one test, that of Boshier himself (1973), where these variables accounted for only about 10% of the variance in dropout. Again, this model is very close to Spady's use of Durkheim's theory of shared group values, and Rootman's idea of person-role fit.

Tinto (1975): A Synthetic Model Based on Recent Literature

Tinto (1975), after Tinto and Cullen (1973), produced what is the most widely cited model of the student attrition process, and the most widely tested in empirical studies (see Pascarella, 1980). This work is highly congruent with the work of Durkheim and Spady. In this model (Figure 2), background characteristics, including family background, individual attributes, and pre-college schooling, interact with each other and are expected to influence both goal commitment and institutional commitment. In the academic system, goal commitment leads to higher grade performance and intellectual development, which lead to academic integration, which in circular fashion, leads to even greater goal commitment. Goal commitment reduces the likelihood of dropping out. In the social system, institutional commitment is expected to produce peer group and faculty interaction, which lead to social integration, which in turn increases institutional commitment. Institutional commitment is also expected to reduce the likelihood of dropping out.

This model is more linear that Spady's model, but contains basically the same elements. The chief conceptual problem of the model is the placement of goal commitment and institutional commitment twice in the model. One type of goal commitment seems to be the product of prematriculation characteristics and the second seems to be the product of academic integration. At any particular point in a student's career, however, the student will have a single notion of goal commitment, which is expected to be the product of both prematriculation characteristics and academic and social integration. That is, experience modifies attitudes. One would expect that the latter set of goal commitments would be the best predictors of dropout decisions, not the initial set. The initial set of goal commitments and institutional commitments seem to be qualitatively different from the latter, viz., they are educational plans,

rather than the commitment to carrying out those plans. This latter commitment comes from a student's interaction with the institution.

Price (1977): Turnover in Work Organizations

The research models used in studying turnover in work organizations may be generalizable to student attrition since both students and employees are members of an organization who may leave. Clearly there are differences between students and employees, but the similarities make the study of models of employee turnover worth assessing in terms of their potential contribution to our understanding of the student attrition process. Price (1977) developed a model of turnover in work organizations which included six independent variables: pay, having close friends, participating in decision making, the repetitiveness of work, knowledge of the work role, and being treated fairly (Figure 3). These variables were expected to influence job satisfaction, and increased satisfaction with one's work was expected to reduce turnover. In addition, opportunity to leave was expected to interact with satisfaction--employees would leave an organization when they were dissatisfied only if they perceived an opportunity to go elsewhere.

Price's model allows for the introduction of an entirely new set of variables that can be used in conjunction with the variables commonly found in attrition studies. (For a listing of such variables, see Lenning, Peal, and Sauer, (1980), Chapter Two; Pascarella (1980); and Pantages and Creedon (1978)). The key to this work is that the determinants of satisfaction and turnover are structural variables, that is, potentially under the institution's control. Even a variable like having close friends (what Price called integration) can be encouraged or discouraged by institutional practices. This model reflects the "naive satisfaction model" of industrial turnover, in which several independent variables influence satisfaction, and satisfied workers stay whereas dissatisfied workers leave. Although logical, empirical evidence for the

relation between satisfaction and dropout (or turnover) is not consistently high (Bean, 1980).

Three characteristics of the model are important. First, Price adds a second type of variable to the model, in this case opportunity, which represents a variable external to the organization. Second, variables similar to pre-matriculation characteristics of students are not gathered for employees. The model is developed without knowledge of the individuals experience prior to coming to work for the organization. Third, the determinants of turnover are very specific and discrete variables, as opposed to variables such as normative congruence used by Spady.

Bean (1978, 1980): An Industrial Model of Student Attrition

Initial adaptation of Price's model to the student attrition process was done by Bean (1978) and slightly modified later (Bean, 1980) (Figure 4). In an empirical study the model was found to hold up much better for women than for men. This explanatory power of this model was evaluated (Bean, 1980) at a major midwestern university, where the variables accounted for 12% of the variance in dropout for men and 21% for women.

This model was expanded substantially by Bean (1979). This version included seven background variables (e.g., parents' education, high school grades) which were expected to influence twenty indicators of the students' interaction with the organization. These variables included having close friends, helpfulness of advisor, informal contact with faculty members, university grades, memberships in campus organizations, as well as other variables suggested by Price's (1977) model and other studies in the educational literature. The social and academic integration variables would be incorporated in this model as organizational variables. The organizational variables were expected to influence seven intervening variables, of which six were attitudinal measures--the other being absenteeism. These intervening variables were expected to influence institutional

commitment, which was operationalized by a measure of intent to stay at the institution. The more the student intended to stay, the less likely the student would be to drop out. In addition to this "main line of effects" there were four personal determinants (goal commitment, major and occupational certainty, and confidence). These were expected to have direct effects on institutional commitment and dropout. Finally, there were six environmental variables (opportunity to transfer, opportunity to get a job, family approval of the institution, family responsibilities, likelihood of marrying, and difficulty of financing one's education). These variables were expected to have direct effects on institutional commitment and dropout, but not necessarily be moderated by the intervening variables.

This model was the first to use several attitudinal variables to predict intent to leave. The expected influences of perceptions of institutional quality, the practical value of one's education, a sense of self-development, satisfaction, boredom, and adjustment on intent to leave were initially derived from the work of Locke (1976). He describes a theoretical, psychological sequence which results in emotions. The causal sequence is as follows: Object (situation)---> perception (cognition)---> appraisal (value judgment) ---> emotion (p. 1330). In the attrition model, the organizational determinants are seen as the objective situations in which the student finds him or herself. This "reality" is first perceived and then appraised. In this way, the intervening variables emerge as the appraisal of the objective situation which is indicated by the organizational determinants. For example, institutional quality is an appraisal of the quality of the institution based on one's information about it and experiences with it.

Bean (1981) has been able to describe about 50% of the variance in dropout using the variables found in this model. Part of the success of the model is due to the attitudinal variables, and intent to leave. Another

important contribution of this model is the operationalization of specific elements within the person-role fit and the social integration variables of Rootman's and Spady's model. Because of the importance of intent to leave, the work of Fishbein and Ajzen (1975, 1977) becomes critical for further development of the synthetic model.

Fishbein/Ajzen (1975): The Importance of Intentions in Influencing Behavior

The basic Fishbein/Ajzen model (Figure 5) indicates that behavior is preceded by an intention to perform the behavior. The immediate antecedents of intent to perform the behavior are attitude toward the behavior, and a subjective norm concerning the behavior. Beliefs about the consequences of a behavior precede the attitude toward the behavior, and normative beliefs about a behavior influence the subjective norm concerning the behavior. A feedback loop from the behavior itself to these beliefs completes the model. Thus, the attitude and the subjective norm about a behavior leads to intention to perform or not to perform the behavior which leads to the behavior itself. Bentler and Speckart (1979) (Figure 6) add a third exogenous variable to this process,that of past behavior. In their model, past behavior, attitude, and a subjective norm all lead to intentions to perform, followed by actual performance of the behavior. Thus attitudes, norms, and past behavior directly influence intention, and all four variables directly influence future behavior. According to this model, dropout decisions at a university should be the result of past behavior, attitudes, and norms, with intent as an intervening variable. Intent replaces institutional commitment as the immediate precursor of dropout decisions. Both the Spady and Tinto models have institutional commitment as the last endodgenous variable before dropout. In the research of Bean (1980, 1981) intent to leave has been the best predictor of attrition, which lends credence to the Fishbein/Ajzen model. Johnson (1980) also reports such findings.

Pascarella (1980): Student Faculty Informal Contacts

Pascarella (1980) has developed a conceptual model of the dropout process, emphasizing the importance of informal contact with faculty (Figure 7). In his model, background characteristics are expected to interact with institutional image, administrative policies and decisions, size, admissions, academic standards, etc. These institutional factors are expected to influence informal contact with the faculty, other college experiences (e.g. peer culture, classroom, extracurricular, and liesure activities) and educational outcomes (e.g. academic performance, intellectual development, personal development, educational and career aspirations, college satisfaction, and institutional integration). Educational outcomes are expected to directly influence persistance/withdrawl decisions. Background characteristics are expected to have a direct influence on institutional factors, informal contact with faculty, other college experience and educational outcome. Informal contact with faculty is expected to influence other college experiences, and be influenced by these. Informal contact with faculty is also supposed to influence educational outcome, and vice-versa, and other college experiences are supposed to influence educational outcomes and be influenced by these.

The model as a whole, is descriptive, being derived from an extensive review of literature on student attrition. As a predictive model, three characteristics are important. First, educational outcomes are expected to be the direct antecedents of persistence/withdrawal decisions. Second, from the perspective of a single institution, institutional factors as a class of variables identified in the model are not important, since they are the same for each student. Third, the relationship between informal contact with the faculty, other college experiences, and educational outcomes, is nonrecursive. Recursiveness, that is, a one-way causal sequence, is not suggested by the model. The complexity of the dropout process, however, is well described. It should be

remembered that Pascarella's model is intended to describe the attrition process in general, whereas the model proposed in this article is intended to describe attrition at a single institution.

The Synthetic Model

Various elements taken from models discussed above can be synthesized into a single model of student attrition (Figure 8). It should be remembered that the purpose of this model is not a full explanation of the dropout process across institutions or at the national level. Instead, it indicates the information which, if known about a student, would likely indicate if that student were going to drop out, and some of the reasons why. The synthetic model identifies four classes of variables: background variables, organizational variables, environmental variables, and attitudinal and outcome variables, all of which have direct or indirect effects on intent to leave, which is the immediate precursor of dropping out. This model allows the researcher to identify classes of variables related in a causal sequence. Variables can be added to or deleted from model to suit the particular needs of an institution. Table 1 indicates how variables, taken from the models discussed in this paper, the author's previous work, and the major reviews of the literature cited here, would be placed in the model. A discussion of the model follows.

Background variables. Background variables represent facts about students before entering college. These variables preceed the student's interaction with the organization or an assessment of the organizational environment as the student's college career proceeds. These variables are included largely to enhance the explanation of organizational variables and environmental variables, and are of practical use for admissions committees. They can be used to indicate the types of problems an institution can expect when admitting students with certain attributes. These variables generally contribute little to the explained variance of dropout, when information is known about organizational, environmental, and attitudinal variables, and intent to leave

(Bean, 1980, 1981). The most important of these variables is probably performance (high school grades and ACT scores), which predicts about 50% of the variance in college grades.

These background variables do not contain attitudinal assessments, but only indicate facts. There are two reasons for this. First, if one knows the educational goals of the student after this person has entered an institution, this information would undoubtedly be more important than initial or prematriculation educational goals in predicting dropout. Prematriculation educational goals would probably be related to the educational goals of the student once enrolled, but it is this secondary assessment of educational goals which would be expected to more profoundly affect a dropout decision. Second, respondents attending the institution could answer these questions without being asked to make assessments about their goals or values prior to matriculation. Thus, a single instrument can be used to assess these background variables. If prematriculation attitudes are to be used as background variables, this information must be obtained before entry into the institution. It is important, nonetheless, to have these variables measured so that one can control their effects statistically when assessing the influence on dropout of the variables which occur later in the model.

Organizational variables. The organizational variables are indicators of the student's interaction with the organization. They are intended to reflect the respondent's objective experience of the organization, (e.g. the numbers of close friends, the amount of informal contact with faculty, the amount of help an advisor gives in specified areas, memberships in campus organizations, etc.) These include the structural variables, that is, variables which can be administratively manipulated. For example, if informal contacts with faculty members reduce attrition, these contacts could be encouraged or required by the institution. If students who do not participate in decision making drop out

of the institution at a high rate, student participation in decision making could be increased. It is these behaviors which, as suggested by Bentler and Speckart (1979), and Locke (1976), will influence attitudes.

The organizational variables are also those variables where one would determine the extent of a student's sharing group values, friendship support, and the regulations of behavior by the institutions (Durkheim, 1951). It is here that variables should be placed in the model which indicate: Spady's (1970) grade performance, normative congruence, friendship support and social integration; Rootman's (1973) actual interpersonal fit, person-role fit, and discussing leaving with insiders and outsiders; Tinto's (1975) grade performance, peer group interaction, and faculty interaction; Prices (1977) pay (grades being a surrogate measure for pay), participation in decision making, repetitiveness, and communication; indicators of the amount of use of any services provided by the university for students; and other institution-specific variables.

Environmental variables. The environmental variables are structural opposites of the organizational variables--that is, variables over which the organization has little or no control. These include opportunity to transfer or get a job, family approval of the institution and the student's major, family responsibilities, the likelihood of marrying, and the difficulty of financing school. Lenning, et. al. (1980) identified three other environmental variables: the military draft, economic cycles, and social forces. Some of the environmental variables (e.g., opportunity to transfer, family responsibilities, and difficulty in financing school) may directly influence dropout. Other variables (e.g., family approval of the institution and the student's major) may have a greater influence on attitudinal variables such as institutional quality. This set of variables has not generally been classified as environmental, and not widely studied (Bean 1978, 1980, 1981). Whereas most research is concentrated on what might push the student out of an institution, these variables

indicate ways in which the student might be pulled from the institution. Again, these variables should reflect more or less objective assessments of the environment outside of the educational institution. Of course, difficulty of financing school might be mitigated by the institution itself, but generally it would reflect parents' income, or the accessibility of special loan programs provided by the state or federal government.

Attitudinal and Outcome Variables. The attitudinal and outcome variables are expected to indicate more subjective evaluations of one's education, educational institution, and goals--a subjective interpretation of the objective educational experience. These variables include assessments of the practical value of ones education, the institution's quality, and one's own self-development, the satisfaction and boredom one feels at school, confidence in being a successful student, adjustment to the institution, certainty of choice in attending the institution, loyalty (the importance of graduating from this institution as opposed to some other), major and occupational certainty, and educational goals. In addition, absenteeism is included in the model here, although being absent is not an attitude but a behavior. These variables include some of what Pascarella (1980) considered educational outcomes, and what Bean (1979) considered personal variables, and certainly contain what Fishbein and Ajzen would call attitudes. Although some direct effects from these variables on dropout are possible, it is expected that most of these variables will have a significant relationship with intent to leave, at least using a t-test. In multiple regression, multicolinearity, and the shear number of these attitudinal variables, would make it difficult for all to be significantly related to intent to leave simultaneously. It is suspected, however, that the attitudinal variables will subsume most of the direct effects of the organizational and environmental variables on intent to leave, and that intent to leave would be better explained

by these attitudinal variables than by others in the model. It should be noted that institutional commitment, important in the models of Spady and Tinto, is here indicated by the attitudinal variable of loyalty, and certainty of choice.

Intent to Leave. Intent to leave is hypothesized to be the best predictor of dropout, and to subsume most of the effects of the attitudinal, organizational, environment, and background variables, in explaining the variance in dropout. Its location in the model is well supported by the extensive research of Fishbein and Ajzen (1975), as well as previous studies of student attrition (Bean, 1980, 1981; Johnson, 1980). The attitudinal variables are expected to be the best predictors of intent to leave, although environmental variables, such as opportunity to transfer, and organizational variables, such as grades, might also to have direct effects on intent to leave. The location of intent to leave is also appropriate in the sense of Merton's (1968) notion of the self-fulfilling prophecy. Thus, the location of intent to leave in the model is supported by theoretical and empirical studies.

Rules for the Inclusion of New Variables in the Model. Table 1 indicates where many of the variables which have received attention by past theoriticians and researchers would be placed in the model. There may be other variables which are perceived to be important for understanding dropout at a particular institution, such as religious variables at a religious college, or a local industry's attempts to hire students before graduation. As a practical matter, as well as maintaining the theoretical integrity of an empirical study, some rules about the placement of variables in the model should be established.

1. Background variables should include only objective information about a student before matriculation, and attitudes, plans, beliefs, etc. which are measured before matriculation.

2. Organizational variables should include only those variables which could be verified by observing a student or the student's record (e.g. the length and frequency of out-of-class contacts with a faculty member, types of subjects discussed, number of memberships in campus organizations, information a student has about rules and requirements, numbers of courses a student is closed out of, etc.).

3. Environmental variables should include objective and subjective assessments of the student's environment--that is, anything which is not directly associated with the organization or its members, which is relevant to the student's decision to remain in school. Opportunities to transfer and the military draft are obvious examples.

4. Attitudinal and Outcome Variables. These variables, by and large, represent the psychological results of interacting with an organization. They should include attitudes toward the institution, evaluations of the educational process and institutional policies, and other outcomes. The location of absenteeism as an outcome rather than an organizational variable, and grades as an organizational rather than an outcome variable, is problematical. Grades are definitely an outcome of organizational interaction, yet, like pay in work organizations, are an objective element in organizational-individual interactions. Absenteeism, an objective and observable element in organizational-individual interactions, is treated in the turnover literature as an immediate precursor of quitting. Final placement in the model will depend on further empirical tests, or the exact question a researcher has about grades or absenteeism.

Conclusion

The synthetic causal model of student attrition presented in this paper contains only five variable types, but Table 1 indicates a notable lack of parsimony. It would be nice, on the basis of a large number of sophisticated multivariate studies, to reduce the number of variables in each category to one or two important ones. This may be done in time, but until the relative contributions of each of these variables is known, it seems unlikely that they can be dispensed with forthwith in the study of student attrition.

To a certain extent, one is left with stepwise multiple regression in a path analytic framework, to assess the relative importance of these variables in their causal sequence. Without replication, however, the results from stepwise multiple regression should be in doubt, and care must be taken to assess the validity of one's findings. Path analysis and multiple regression do provide a useful tool for assessing of the strengths of the relationships among the variables, and effects coefficients (Lewis-Beck, 1977) indicate the total contributions of one variable on dropout in terms of both indirect and direct effects. Because of the location of the intent to leave in this model, such effects coefficients are almost a necessity. Also, multiple regression allows for the interpretation of interaction effects where these may exist. With such a large number of variables, many variables which may not have significant main effects, may significantly interact with a second variable when dropout is regressed on them. An exploration of this forest of interaction terms also would be advisable for future researchers in the area. Finally, the LISREL procedure described by Jörkeskog and Sörbom (1978) also should prove to be of potential value in assessing the path coefficients in the model.

This model does provide the researcher with the opportunity to clearly distinguish between classes of variables when conducting investigations of

student attrition. Such clarity should be extremely helpful in organizing future studies, and in the generalization of results from one institution to another. There are 23 variables in Table 1, marked with an asterisk, which are presumed to be more important predictors of dropout then the remaining variables. Still, the task of reducing the number of variables in this model and identifying significant interactions lies ahead. In addition, the extent to which significant variables differ at different types of institutions, and at different grade levels, should be assessed. The practical importance of this theoretical model should be clear any time the number of students enrolling in institutions of higher education is expected to decrease, and keeping a matriculated student enrolled is a matter of institutional survival.

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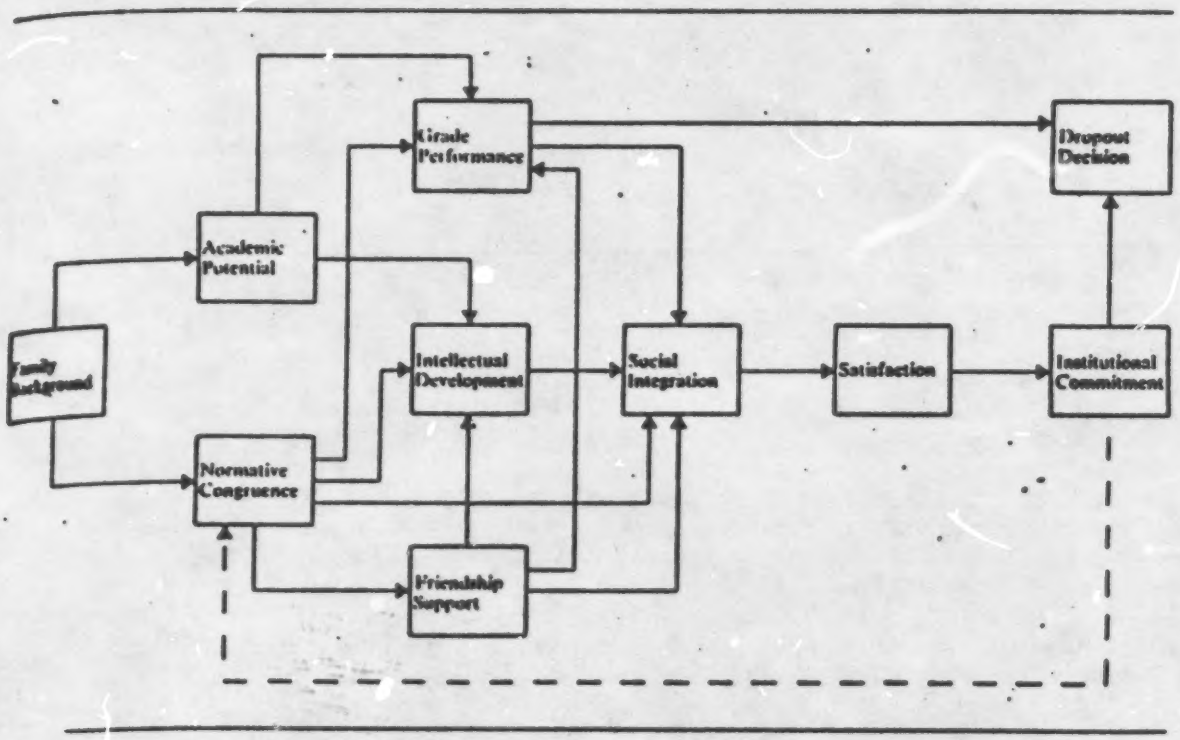


Figure 1. Spady (1970): An Explanatory Sociological Model of the Dropout Process

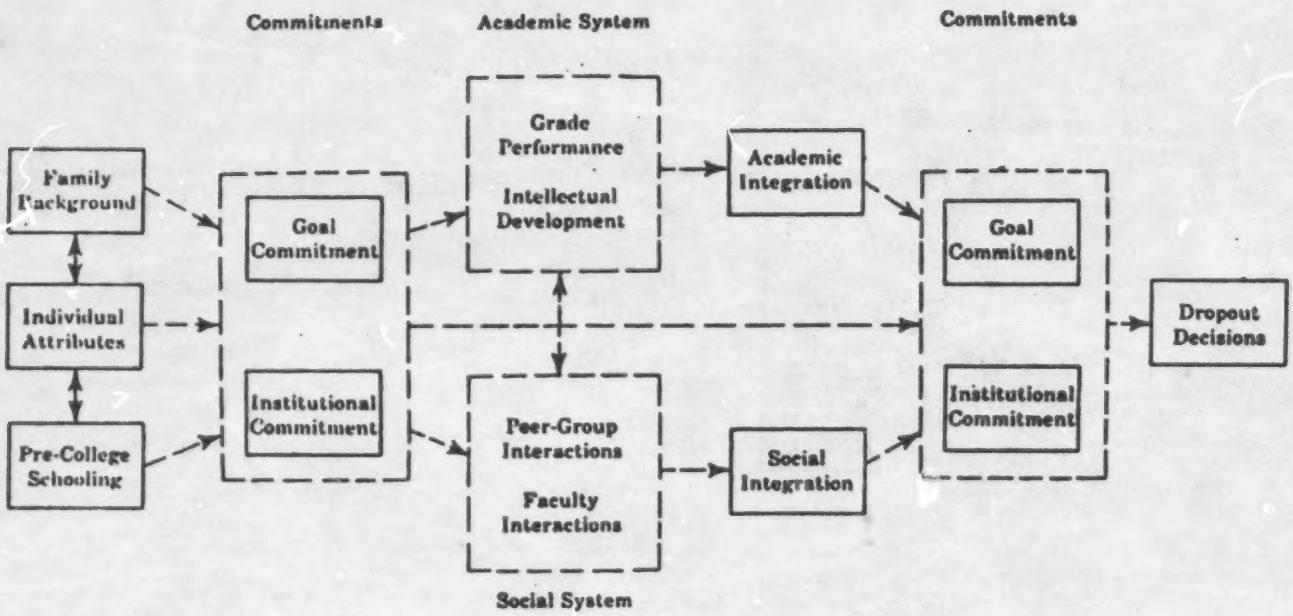
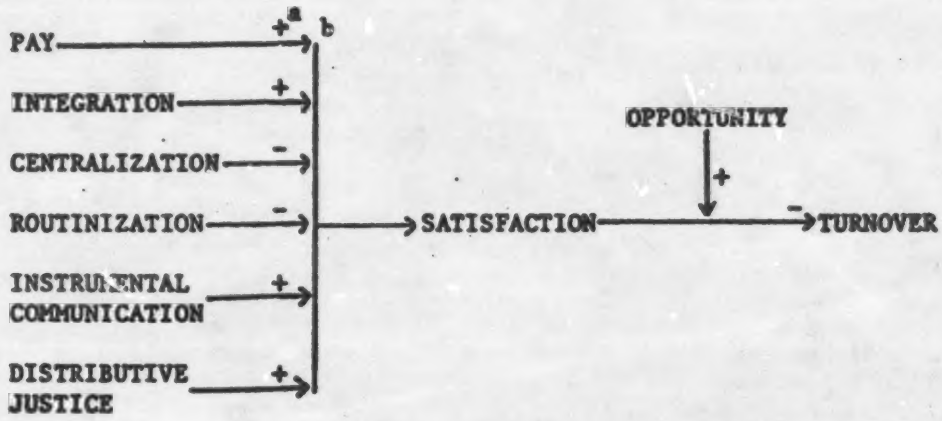


Figure 2. Tinto (1975): A conceptual Schema for Dropout from College



[a]A "+" indicates a positive relationship and a "-" indicates a negative relationship.
[b]Arrows indicate the direction of the relationship.

Figure 3. Price (1977): Relationships between the determinants, intervening variables, and turnover (modified by Bean (1978))

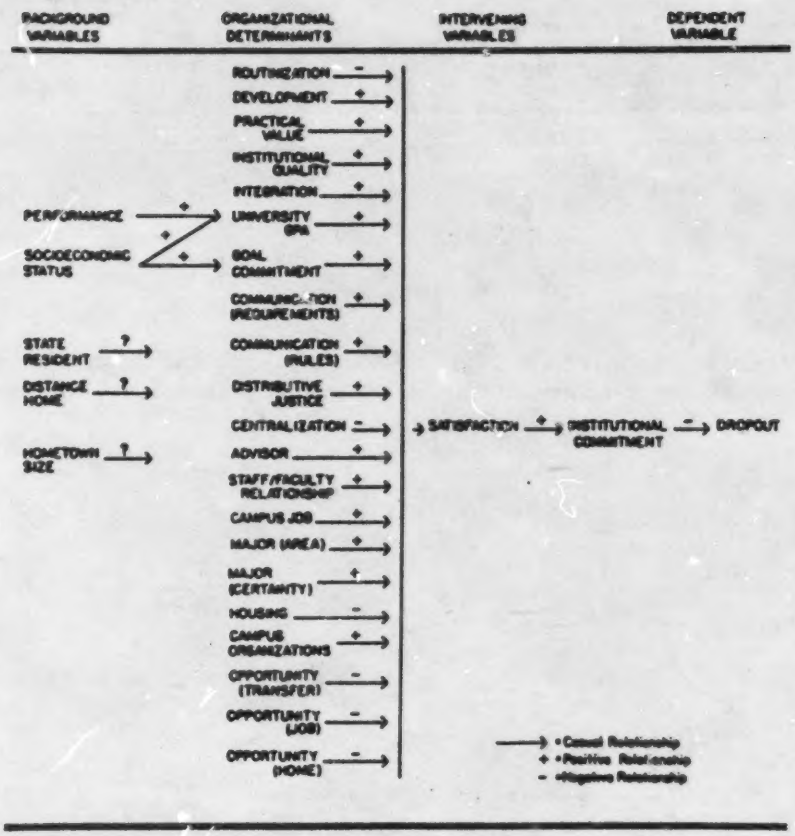


Figure 4. Bean (1980): A Causal Model of Student Attrition

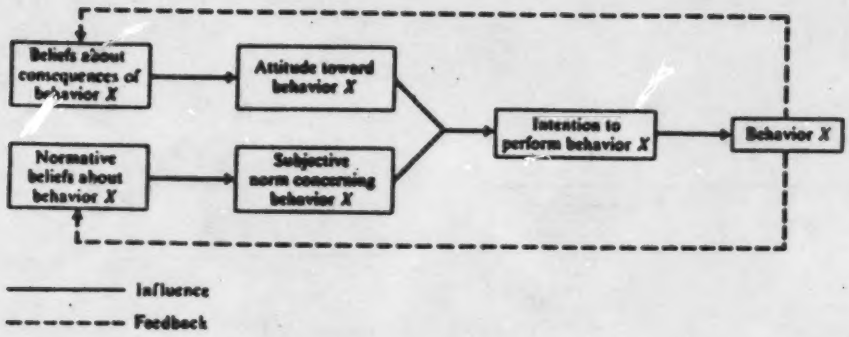


Figure 5. Fishbein and Ajzen (1975): Schematic presentation of conceptual framework for the prediction of specific intentions and behaviors.

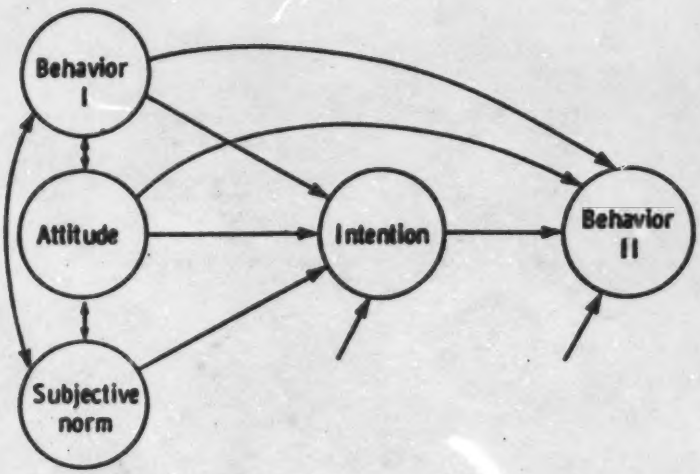


Figure 6. Bentler and Speckart (1979): A generalized Attitude-Behavior Relations Model.

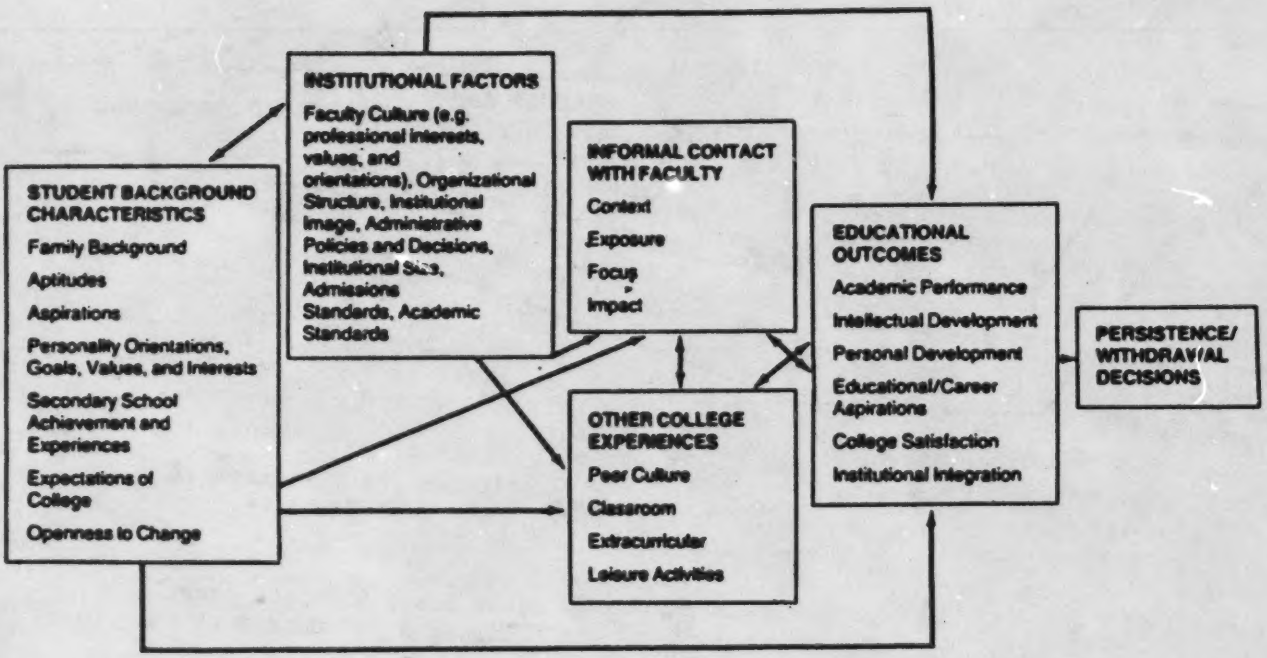


Figure 7. Pascarella (1980): Conceptual model for research on student-faculty informal contact.

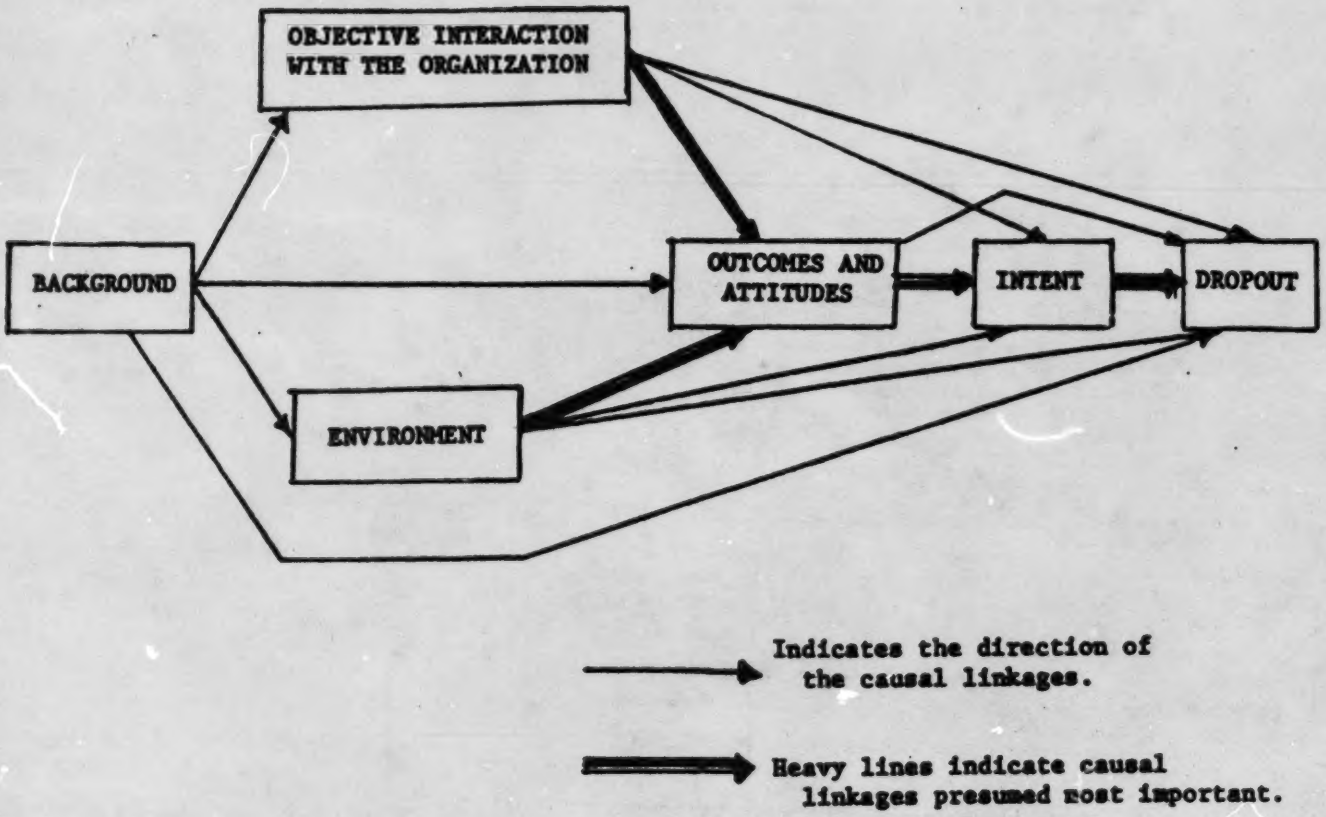


Figure 8. A Synthetic Causal Model of Student Attrition

Table 1. Variables Classified for Use in the Causal Model of Student Attrition

BACKGROUND VARIABLES

*Mother's Education
*Father's Education
*High School Grades
*Achievement Test Scores
High School Size
Home Town Size
College Preparatory Curriculum
Distance Home
State Resident
Head of Household Occupation
Parents' Income
Religion

ENVIRONMENTAL VARIABLES

*Opportunity (transfer)
Opportunity (job)
*Family Approval (institution)
Family Approval (major)
Family Responsibilities
*Likelihood of Marrying
Difficulty of Financing School
Military Draft
Economic Indicators (CPI Index, Employment Rate)
Social Fads

OUTCOME AND ATTITUDINAL VARIABLES

*Practical Value
Institutional Quality
Self-Development
Satisfaction
*Boredom
*Confidence
Adjustment
*Certainty of Choice
Fairness of Treatment
Competitiveness of Academic Program
*Loyalty (Institutional Commitment)
*Major Certainty
Occupational Certainty
*Educational Goals
*Absenteeism

ORGANIZATIONAL VARIABLES

Regulation of Life at School
Repetitiveness of School
Communication of Policies
*Close Friends
Helpfulness of Advisor
*Informal Contact with Faculty
*Grades
Participation in Decision Making
*Memberships in Campus Organizations
*Curriculum (availability of preferred courses)
Housing
Job
University Services Used
Peer Culture
Leisure Activities
Financial Aid
*Discussed Leaving With Outsiders
*Discussed Leaving With Insiders

INTENTIONS

*Intent to Leave

VARIABLES FOR STATISTICAL CONTROL

Age
Ethnicity
Year in School
Full-time/Part-time Status
Transfer/Non-transfer
U.S. Citizenship
Sex

*Presumed to have a greater influence on dropout than other variables in the category.